CLAIMS

I claim:

1. A method of monitoring and controlling voltage potential on a human body comprising the following steps:

a) electrically connecting an operator to a quasi virtual ground terminal by providing a contact with skin of the operator via at least one electrode,

b) continuously monitoring a triboelectric current flowing into said quasi virtual ground terminal, and

c) providing means to interrupt a path-to-ground when a dangerously large current is detected.

2. The method of claim 1 wherein:

included in said method is a means to determine whether or not the operator is properly wearing said electrode.

3. The method of claim 1 wherein:

said means to determine whether or not the operator is properly wearing said electrode comprises a means to detect bursts of tribolelectric current.

4. The method of claim 1 wherein:

included in said method is a means to interrupt said path-to-ground when there is an interruption to a power supply.

5. The method of claim 1 wherein:

a maximum resistance in said path-to-ground does not exceed 10 Kohm, such that a majority of peak body voltage potential excursions will not exceed 100 millivolts.

6. The method of claim 1 wherein:

said at least one electrode is a silver / silver chloride electrode.

7. The method of claim 1 wherein:

an amplitude and polarity of said triboelectric current are displayed on a visual display device.

8. The method of claim 1 wherein:

said method comprises two of said electrodes in contact with skin of the operator such that two separate paths-to-ground are formed, said method including monitoring integrity of said paths-to-ground by comparing current flow through a first one of said paths-to-ground to current flow through a second one of said paths-to-ground, wherein a differential greater than a predetermined limit triggers alarm means.

9. The method of claim 1 wherein:

said system comprises two of said electrodes in contact with skin of the operator such that two separate paths-to-ground are formed, said system monitoring integrity of

at least one of said paths-to-ground by monitoring voltage in said at least one path-to-ground, wherein a voltage greater than a predetermined limit triggers alarm means.

10. A circuit to control and monitor voltage potential on a human body comprising:

an electrode in contact with skin of an operator and a ground fault interrupter integrated circuit in a path-to-ground,

a current transformer,

relay contacts, and

a bleeder resistor; wherein

triboelectric current bursts detected by said electrode flow through a test path comprising a primary of said current transformer, said relay contacts, and said bleeder resistor, a resistance value of said test path added to a value of a skin-to-electrode resistance determines a worst case body voltage potential excursion, and

a secondary of said current transformer is connected to an input of ground fault interrupter integrated circuit such that if a current exceeding a preset level flows through said path-to-ground, said ground fault interrupter integrated circuit opens said relay contacts, thus interrupting said path-to-ground.

11. The circuit of claim 10 wherein:

said ground fault interrupter integrated circuit is constructed such that said relay contacts 16 close only when said ground fault interrupter integrated circuit is properly powered.

12. A circuit to control and monitor voltage potential on a human body comprising:

an electrode in contact with skin of an operator and a ground fault sensing / relay / current limit stage in a path-to-ground,

a ground fault bistable multivibrator,

a window detector, and

an alarm means; wherein

triboelectric current bursts detected by said electrode enter said ground fault sensing / relay / current limit stage, a first signal is picked off from said ground fault sensing / relay / current limit stage and is processed in said window detector; such that

if an amplitude of said first signal exceeds a predetermined level, said ground fault bistable multivibrator causes said alarm means to be activated and further causes a relay contact in said ground fault sensing / relay / current limit stage to open said path-to-ground.

13. The circuit of claim 12 wherein:

a power-on fail safe mechanism ensures that a relay in said ground fault bistable multivibrator is in an open state at any time power is applied to said circuit, said relay in said ground fault bistable multivibrator is closed by a manual reset.

14. A circuit to control and monitor voltage potential on a human body comprising:

an electrode in contact with skin of an operator, a ground fault sensing / relay /

current limit stage, and a current-to-voltage converter in a path-to-ground,

a filter,

an absolute value amplifier,

display means,

a window detector,

a ground fault bistable multivibrator,

an astable multivibrator,

an activity detector means, and

an alarm means; wherein

triboelectric current bursts detected by said electrode enter said ground fault sensing / relay / current limit stage, a signal from said ground fault sensing / relay / current limit stage being processed through said current-to-voltage converter, said filter, and said absolute value amplifier, said absolute value amplifier converting bipolar signals into positive unipolar signals, said unipolar signals driving said display means; and wherein

a first signal is picked off from said display means to drive said activity detector means, and concurrently, a second signal is picked off from said ground fault sensing / relay / current limit stage, said second signal being processed through said window detector and through said ground fault bistable multivibrator, outputs of said activity detector means and said ground fault bistable multivibrator drive multivibrators which in turn drive said alarm means; such that

said alarm means is activated when said circuit does not detect said triboelectric

current bursts and when inadvertent contact with a power source occurs.

15. The circuit as claimed in claim 14 wherein:

an output signal of said ground fault bistable multivibrator causes a relay to open if the operator accidentally contacts a live power wire.

16. The circuit as claimed in claim 14 wherein:

an output signal of said ground fault bistable multivibrator ensures blanking of said display means unless said ground fault bistable multivibrator has been manually reset.

17. The circuit as claimed in claim 14 wherein:

a power-on fail safe means insures that said ground fault bistable multivibrator is set to a proper logical state after any interruption in power supply.

18. The circuit as claimed in claim 14 wherein:

functions of said absolute value amplifier, said ground fault bistable multivibrator, said astable multivibrator, and said activity detector means are executed by a microprocessor.

19. The circuit as claimed in claim 14 wherein:

said circuit comprises two electrodes in contact with the skin of the operator, said

two electrodes being electrically isolated, and each of said two electrodes being an element of an independent path-to-ground; wherein

said alarm means is activated if a difference between a current flowing through a first one of said paths-to-ground and a current flowing through a second one of said paths-to-ground is greater than a predetermined level, said difference indicating a compromise in at least one of said paths-to-ground.

20. The circuit as claimed in claim 14 wherein:

said circuit comprises two electrodes in contact with the skin of the operator, said two electrodes being electrically isolated, and each of said two electrodes being an element of an independent path-to-ground; wherein

said alarm means is activated if a voltage potential detected in either of said paths-to-ground is greater than a predetermined level, said voltage potential indicating a compromise in at least one of said paths-to-ground.